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THE BARTH IRON ORE DEPOSIT

By J. Claude Jones

The deposit was acquired and developed by the American Smelting and Refining Company and was known as the West Iron Mine. During the period of operation they took out over 240,000 tons which was shipped to the smelters at Salt Lake City. W. H. Emmons visited the mines in 1907 and suggested that the deposit was the result of contact metamorphism. He considered the rock that encloses the ore to be a fine-grained diorite, and stated that he found a metamorphosed rock, presumably of sedimentary origin, in contact with the diorite a short distance south of the mine. The writer made his examination of the mine during the fall of 1911.

The mine workings consist of an open pit about 200 feet in diameter and 80 feet deep sunk in solid ore. About 20 feet above the bottom of the pit a series of cross-cuts and drifts have been run as the upper or "dry" level in an extension of the ore to the south and east. Two levels approximately 50 feet apart vertically and below the upper level have been opened up down the dip of the orebody and connect with an inclined shaft that follows the dip of the ore for 180 feet. The chief production of the mine has come from the pit and the development work in the levels, although at the time of the last visit the upper level was being caved.

The topography of the surrounding area is characteristic of the Great Basin in which it lies. The Cortez Range, trending north and south, rises two to three thousand feet from the broad flat

valleys on either side. It is a rough-hewn block of andesites and rhyolites that has been faulted up to its present position. The Humboldt River, flowing westerly, cuts directly across the range in a narrow steep-walled canyon known as the Palisade Canyon. The west rim of Safford Canyon is a low ridge, the northern spur of which is formed by the outcrop of the ore body. In the vicinity of the mine the surface is formed by a thick andesitic flow.

The rocks in the vicinity of the mine have been gently tilted to the west as a part of the monocline forming the faulted block of the Cortez Range. Aside from a few minor faults of slight displacement and local extent noted in the ore body, there has apparently been no other displacement or diastrophic movement.

The ore deposit is located on the point of the spur marking the junction of Safford Canyon with the Palisade Canyon. A low silicified knob of andesite just west of the pit marks the original outcrop of the ore. At the surface the deposit is a thick lens about 100 feet in thickness and about 200 feet long, dipping 40° to the northeast. It is entirely surrounded by the andesite except where the gravels and sands of the steam beds rest upon its eroded surface to the north and east. The northern part of the foot wall as exposed in the pit is undulatory and lies in three benches as if step-faulted. To the south these are sharply truncated and the ore extends back to a nearly vertical wall of the andesite. While there has been some slight movement along the boundary of the ore body and slickensides are to be occasionally found, wherever there is a possibility of measuring the displacement, as in the case of the veins penetrating the foot-wall, the actual movement has been small. In no

case was there sufficient movement detected to account for the step faulting of the ore body as a whole and it is evident that the undulatory character of the foot-wall was produced at the time of the deposition of the ore.

There is no gradation between the ore and the andesite. In the lower levels of the mine the form of the ore body as developed shows a striking change from that in the pit. The large extension of the ore to the southwest is absent below and the ore pinches to a thin vein as the foot and hanging walls come together at the extreme south. From the latter point the ore rapidly widens until it is over a hundred feet thick at the north.

Logs of Drill Holes at Barth, Nevada

South	No. 1	No. 2	No. 3	North
Gravel	44'	42'	39'	
Andesite.....	90'	116'	8'	
Ore.....	60'	107'	157'	
Andesite.....	8'	9'	11'	
Total....	202'	274'	215'	

"The ore is massive hematite through which microscopic euhedral crystals of apatite are disseminated. It shows little variation throughout the ore body either in depth or towards the walls. It is somewhat magnetic and in parts of the mine will deflect a magnetic needle to a notable extent. Although no ferrous iron could be detected in any of the samples of ore analyzed, it is probable that some magnetite exists in the ore. All of the ore at present exposed has

been subjected to the oxidizing effects of the circulating meteoric waters and judging from the present wetness of the mine it is certain that these have had free access to the ore. The magnetite that was originally deposited with the hematite has probably been largely oxidized, and it will be possible to obtain the correct composition of the original ore only when the mine workings have extended below the oxidized zone. A specimen obtained at the hanging wall contact on the lower level, showing the replacement of the andesite by the ore, contained much magnetite and it is probable that much of the original ore was magnetic.

The following analyses made by Mr. Palmer show the slight variation of the ore on the different levels.

Analyses of Iron Ore at Barth, Nevada.

	Upper Level.	Intermediate.	Lower Level
Insoluble.....	1.98	1.80	.45
Fe_2O_3.....	95.15	89.19	98.44
FeO.....	none	none	none
Al_2O_3.....	1.85	3.52	1.16
P_2O_5.....	not det.	.69	not det.
CaO.....	.43	1.94	trace
Ignition.....	.44	2.53	.05
Total.....	99.85	99.67	100.10
Total Iron.....	66.54	62.37	68.84

The ore is of high quality and uniformity and were it not for the lack of cheap fuel and high cost of transportation, it would be

used for the manufacture of iron and steel. The phosphorous content is above the Bessemer limit, yet it is much below that of the Alabama ores. Possibly with the development of electric smelting, this as well as other deposits in the state can be utilized for the making of iron and steel."

The apatite crystals were elongate and rectangular in shape and averaged a half millimeter in length. There is no apparent variation of the ore.

Jones then states that the orebody is of the replacement variety.

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